Using Personal Digital Assistants to Support Students

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Background and rationale

As participation in higher education increases, larger numbers of people from non-traditional backgrounds are entering universities such as Wolverhampton. These students are expected to need more support in becoming familiar with the novelty and complexity of studying new subjects as undergraduates in a large university. They are consequently expected to be the students at most risk of failure to progress beyond the first year of their course and consequently of failing to realise their full potential.

Apart from adjusting to the methods of learning and teaching at a university, all students now face unprecedented financial pressures. These mean that the vast majority are forced to take substantial part-time, work whilst studying full-time. This can mean that attendance at lectures, seminars and workshops is jeopardised and progress is undermined by breaks in continuity and disruption to group projects.

In addition, universities have attempted to increase the accessibility of higher education by an increased variety of modes and timetables. Whilst this facilitates wider take up, it also increases the logistical complexity of the world that new students enter.

This project sought to explore the use of handheld computers (personal digital assistants, PDAs) in addressing some aspects of this problem and also to begin to explore the cost-effectiveness of institutional support for providing these devices.

The innovation

The project aimed to explore the potential of using handheld computers (PDAs) to enrich student learning and provide increased and more responsive and targeted pastoral support. It also aimed to explore the economic case for using PDAs on an institution-wide basis, in terms of fee income, PDA failure and attrition rates, administrative support and retention rates. The project objectives were to evaluate the potential of student PDAs in teaching, learning and assessment, and also in course administration and management and student support and guidance, particularly with students 'at-risk' due to poor attendance, poor performance or poor personal information and organisation skills.

There had been relatively few such projects, either in the UK or elsewhere, and it was anticipated that the project would illuminate the potential and the problems rather than providing definitive data on either. Thanks to support from Sony, the School of Computing and IT (SCIT) was able to run this small pilot project that attempted to explore some of these problems. Sony lent the School sufficient handheld computers, Sony Clié SJ22, for each student on the first-year of the HND computing course.

The Sony handhelds were equipped with software for reading documents and the course notes and lecture slides were installed on each machine. The personal information management software was used to provide ready access to tutors' contact details; also included were course timetables with alerts for assessment deadlines.

Technical and administrative procedures were put in place in September 2003 so that each SJ22 could be 'synched' (that is, the data on the handheld could be backed up and synchronised with a master PC in the University) on a regular basis. This meant that up-dates, alterations and additions to original information could be made easily available to the students. This was especially useful in the students' early days at the University when there were frequent room-changes and other alterations to their timetables. (One student commented how useful this had been when they were still very unfamiliar with university life; another said that the handheld computers 'made everything really easy'.)

"Synching" was recognised as a serious issue when a number of machines were being refreshed from one master PC. The ideal situation would have been for students to keep personal and public information on their handheld computers and for this information to be up-dated and backed-up onto the master PC. (The literature suggested that for student "buy-in" this was essential but with a fixed-term project still problematic.) Data protection considerations meant that the technical configuration was critical if personal information from one student was not to be backed up to the master PC and then "leak" down to the handheld computers of everyone else in the group. The School took a very conservative position on this issue and was mindful of the implications of the Data Protection Act. When this proved too restrictive, it was revised.

The students came into the University every Friday to "synch" their PDAs. This in itself was a useful check on serviceability, student attendance and progress.

The outcomes

Pedagogic

The students were supported throughout the year with an initial brief as to the nature of the project, stressing how it was hoped that the use of a PDA device could assist them in becoming more organised, and support their learning. Those students who volunteered to participate in the project were given a training session on the use of the devices. This was given a few days after initial distribution of the PDAs to give time for the students to become familiar with them, and to see some of what it had to offer. The session used a PC emulator of PalmOS and the students were taken through the functionality. The students had their PDAs with them and were able to follow the activities. Students were also shown how to use the PC software, and how to synch with their PCs at home.

Attendance at this session was rather disappointing. In retrospect, it would have been better to issue the devices at the end of the training – which would have guaranteed 100% attendance. Those who did attend were very positive in their feedback as to the usefulness of the event.

In terms of on-going support, students would seek out help from one of the project team when difficulties were encountered. This was a rare occurrence. It was felt that this was due to two factors. Firstly, the PDA operating System, although not Windows-based, was intuitive and easy to use. Secondly, the students participating were Computing students and therefore had a pre-disposition to adopting and exploiting new technology.

Technical

The project team have devised and tested suitable protocols for 'synching' a class set of PDAs.

A range of material was put on to all student PDAs on a weekly basis, e.g. lecture notes for the forthcoming week. As the PDAs were not Windows-based, they did not have native support for products such as PowerPoint and Word. A range of products was available which allowed the viewing of these documents on a PalmOS PDA, but the cost was prohibitive. It was decided that the lingua franca would be Adobe Acrobat format. Adobe produced a Reader for the PalmOS machine. Therefore, the first stage in preparing the

material to be synched was to convert the Microsoft files to Adobe Acrobat files on a Windows PC.

The second stage was to place these files on a PDA. One of the project team maintained a 'master' PDA for reference purposes. A dedicated PC was placed in the school office. Student would bring their PDAs to this PC for synching. The tutor then used the 'reference' PDA to synch with the office PC. This then contained all the material in the tutor's area. Synching was by means of a 'conduit'. This is a channel, where the user specified the direction of the synching. The tutor would always specify that the files on the PDA overwrote those on the PC. The conduit was identified by an ID stored on the PDA, specified by user on first use of the PDA. Students were instructed to use their student number. This allowed the team to track that PDAs had been synced on what occasions.

Once the 'reference' PDA had been synced with the PC, the new files were in a folder on the PC whose name was that of the I.D. of the PDA. These files were then copied across to all the other conduit folders ready for synching to the student PDAs.

The last job was to ensure that the synching software was set to synchronise the files on the PDA and PC, rather than have files overwritten e.g. "PC overwrites PDA". In this way the files in each conduit folder contained the learning material, plus any files that the student had created, such as Personal Appointments, Address book etc. By having these separate conduits, the project team were assured of the security and integrity of the data held by each student.

Benefits

This was very much an exploratory project intended to identify rather resolve the likely hurdles to any student strategies that exploit PDAs.

Evaluation

The student evaluation was based on two sessions with students, taped and selectively transcribed, and numerous email conversations with approximately half the students in the group. At the end of Semester One, an informal focus group was held to identify key themes. Students were very positive about their involvement in the project. They were impressed with the size, performance, functionality and styling of the SJ22 and they considered the machines good value-for-money. They commented very favourably on the battery life and earlier research with other universities suggested that there would be few, if any, problems with serviceability or reliability.

The students talked about using the lecture notes on the handhelds. These notes meant that they could refer to lecture material from previous weeks to help understand their current lectures and could refer to lecture material in their practical workshop sessions. They found many aspects of the personal information management (PIM) software helpful, accessible and easy to use. There was a need for longer-term trials in order to allow students to invest the up-front effort of loading and maintaining their personal data in a device, as their sole PIM device over any others they might own or use, for example their mobile 'phone or Filofax. Finally, the students seemed to like the dedicated data entry script, Graffiti, and thought it fun to use – it may hold the same arcane attraction for young people as the sub-cultural language of 'txt'. Early negative issues raised informally with the Course Leader included:

- Some students wanted wireless-connectivity, web and email access, and support for Microsoft applications (especially Word).
- Some students wanted a smartphone
- Some students were unhappy with a non-Microsoft environment.

It was clear however that not all of the applications on the handheld were intuitive and that the group had insufficient induction and training in using the machines. It became apparent that they thought Memory Sticks (which they all regarded as expensive) were essential for personal data storage and that they were confused about some other aspects of interoperability with PC software. Some other students believed that a home PC with an Internet connection was necessary if they were to download extra software. These misunderstandings were exacerbated by the synchronisation configuration adopted by the School and this was subsequently revised and the students were given more training.

At the end of Semester Two, another informal focus group was held to identify usage and problems. There were several recurrent themes:

- Students nearly all had sophisticated up-to-date mobile 'phones which they used for some PIM activity, and in addition they thought the PDA inferior and was an extra gadget to carry
- Not many students travelled by public transport and so could not use their PDAs whilst travelling
- Most students did not have sophisticated PIM strategies.
- Usability – reading the screen, especially PDF-based presentations, and entering data were not easy and future material would need careful reversioning.

There was however considerable variety in their responses. Retrieving the loaned PDAs was in some cases problematic.

In looking at the institutional implications of the student evaluation and the technical evaluation, there are a number of conclusions:

- If PDAs, or more likely smartphones, were to form part of the institutional student support strategy, a loans scheme modelled on the existing 'laptops-for-loan' scheme would be problematic and a simpler solution would be to bundle the cost into student fees. The cost of any mid-range PDA is minimal compared to fee income.
- Any scheme using PDAs or similar devices needs a thorough induction, training and support programme for staff and students.
- Delivering content, for example course material, using mobile devices requires simple reversioning, careful selection and ongoing maintenance. It also needs to stay consistent with course material in other formats and media.

Future developments

The E-Innovations Centre is building on this work with PDAs. It has run one national workshop for academics attracting 95 delegates in June 2004 and is planning more for the academic year 2004/2005

The project team are now engaged in a follow up project that supports staff interested in using any mobile technologies (especially SMS phones and PDAs) in learning, teaching, assessment and administration and are applying the lessons learned in a pilot in another School.

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